

Spring Hippocampal Research Conference

22-27 May, 2011 Verona, Italy

SCIENTIFIC PROGRAM

SUNDAY, 22 May, 2011

10am-6pm REGISTRATION

(Palazzo Verità Poeta, Vicolo San Silvestro, 6;
see map on page 12)

Please pick-up your registration material 10-11:30am

12:45pm WELCOME AND ANNOUNCEMENTS

1:15-2:15pm Session #1 "Mossy fiber plasticity and memory; novel, malleable, and functional organization"

Aryeh Routtenberg (Northwestern University, USA), Chair

Alexander Drakew, A. Tippmann, and M. Frotscher (University of Freiburg, Germany)

"Mossy fiber plasticity: role of the spine apparatus"

Aryeh Routtenberg (Northwestern University, Evanston, IL, USA)

"Post-acquisition transmembrane signaling and structural remodeling as substrates for a long-lasting memory mechanism"

Pico Caroni (Friedrich Miescher Institute, Novartis Research Fdn., Basel, Switzerland)

"Structural traces of learning and memory retrieval in the hippocampus"

Nicolas Toni (Univ. Lausanne, Switzerland)

"The addition of new mossy fiber terminals in the adult"

2:15-3:30pm Session #2 "Why is the dentate gyrus and what has it done for CA3 lately?"

Bruce McNaughton (University of Lethbridge, Canada), Chair

Bruce McNaughton (Univ. of Lethbridge, Canada)

"Do granule cells really retire early?"

Rob Sutherland (University of Lethbridge, Canada)

"Adult granule cell genesis, degeneration, and modification of mnemonic processing"

Brian Derrick (Univ. Texas San Antonio, USA)

"The dentate-CA3 interface - dynamic or static?"

Steve Mennerick (Washington University, St. Louis, MO, USA)

"Spike initiation disparities between CA3 neurons and dentate granule neurons: a whodunit mystery"

James Knierim (Krieger Mind/Brain Institute, Johns Hopkins University, Baltimore, MD, USA)

"Pattern separation and pattern completion in the DG and CA3 regions"

3:30-4:00pm Coffee Break

4:00-5:00pm Session #3 "Temporal lobe epilepsy with hippocampal sclerosis - can subfield pathology predict outcome?"

Ingmar Blümcke (Erlangen, Germany), Chair

Roberto Spreafico (Milan, Italy)

"Clinico-pathological spectrum of mesial temporal lobe epilepsy: proposal of a new international consensus classification for hippocampal sclerosis"

Neda Bernasconi (Montreal, Canada)

"Imaging subfield pathology in human hippocampal sclerosis"

Fernando Cendes (Campinas, Brazil)

"Imaging markers of pharmacoresistance in TLE patients"

Katja Kobow (Erlangen, Germany)

"The methylation hypothesis in temporal lobe epilepsies"

5:00-6:15pm Session #4 "Etiology of mesial temporal lobe epilepsy with hippocampal sclerosis; data from clinical and experimental research"

Felix Rosenow (Marburg, Germany), Chair

Felix Rosenow and Katja Menzler (Philipps-University Marburg, DE)

"Clinical presentation and postoperative course of MTLE-HS vs. MTLE-cavernoma"

Philipp S. Reif and Felix Rosenow (Philipps-University Marburg, DE)

"A common SCN1A polymorphism - more frequent in patients with MTLE-HS and febrile seizures?"

Mareike Nowak, Hajo M. Hamer, and Sebastian Bauer
(Philipps-University Marburg & Friedrich-Alexander-Universität Erlangen, DE)

"Immunological data in MTLE-HS vs. other epilepsy syndromes"

Sebastian Bauer, William P. Gray, Anan Shtaya, Nicola Hamil, and Matthew C. Walker
(Philipps-University Marburg, Germany; University of Southampton, UK; UCL,UK)

"Effect of NPY on hippocampal neurogenesis after status epilepticus"

Braxton Norwood, Robert Sloviter, and Felix Rosenow (Philipps-University Marburg, Germany)

"Data from a toxin-free model of MTLE with hippocampal sclerosis"

8:00pm Dinner at the Palazzo

Monday, 23 May, 2011

9:00-10:15am Session #4 "That "other" part of the temporal lobe involved in perception and memory"

Carol Barnes (University of Arizona, Tucson, AZ, USA), Chair

Morgan Barense (University of Toronto)

"Mechanisms of forgetting: neural representations for memory and perception"

Mary Peterson (University of Arizona, Tucson, USA)

"Abnormal shape memory influences on figure-ground perception in medial temporal lobe amnesia"

Lee Ryan (University of Arizona, Tucson, USA)

"Functional compensation in older adults: interactions between frontal and perirhinal functions"

Betsy Murray (National Institute of Mental Health, NIH, Bethesda, MD, USA)

"Role of perirhinal cortex in memory and perception: conjunctive representations for object identification"

Carol Barnes (University of Arizona, Tucson, USA)

"Effect of aging on object recognition and perirhinal cell ensembles"

10:15-11:30am Session #5 "Transcriptomic, genomic and epigenomic approaches to hippocampal function and dysfunction"

Yuri Bozzi (Trento, Italy) and **David Henshall** (Dublin, Ireland), Chairs

Eleonora Aronica (AMC, University of Amsterdam, The Netherlands)

"Regulation of hippocampal gene expression during epileptogenesis"

Roger Simon (Morehouse, Atlanta, GA, USA)

"Proteomic and epigenetic mechanisms in ischemic tolerance"

Cliff Abraham, Margaret Ryan, Barbara Logan, Joanna Williams
(Brain Health Research Centre, University of Otago, New Zealand)

"LTP-associated gene expression: NFkappaB as a potential hub of activity"

David Henshall (RCSI, Dublin, Ireland)

"Hippocampal transcriptomes in epileptic tolerance"

Yuri Bozzi (CIBIO-CNR, Trento, Italy)

"Hippocampal gene expression profiling in a mouse model of autism"

11:30-12:15pm Session #6 "Hippocampus and hormones"

Gabriele M. Rune (Hamburg) and **Luis Miguel García Segura** (Madrid), Chairs

Gabriele M. Rune (Hamburg, Germany)

"The role of reelin-aromatase crosstalk in hippocampal synaptic plasticity"

Tallie Z. Baram (UC Irvine, USA)

"How modern-life stress impacts Memory: novel mechanisms"

Luis Miguel García Segura (Instituto Cajal, Madrid, Spain)

"Estrogens and neuroprotection: the role of glia"

12:15-2:15pm Free for Lunch

2:15-3:30pm Session #7 "Assuming the position: control of subcellular localization and function of voltage-gated ion channels in hippocampal neurons"

Dane Chetkovich (Northwestern University Medical School, Chicago, USA), Chair

Dane Chetkovich (Northwestern University Medical School, Chicago, USA)

"Control of HCN channel localization in hippocampal pyramidal neurons"

Andrea Lorincz (Institute of Experimental Medicine, Budapest, Hungary)

"Molecular identification of dendritic Nav channels in CA1 pyramidal cells"

Josef Bischofberger (Department of Biomedicine, University of Basel, Switzerland)

"Fast sodium channel gating supports localized axonal AP initiation in hippocampal mossy fibers"

Mala Shah (University of London, England)

"Role of Axonal Kv7 channels in mediating intrinsic excitability of hippocampal neurons"

Matthew Nolan (University of Edinburgh, Scotland)

"Bi-directional *in vivo* homeostatic plasticity in mature dentate granule cells"

3:30-6:00pm Sessions 8 & 9 "Neurogenesis in normal and abnormal brain"

Merab Kokaia (Lund, Sweden) and **Felice Tirone** (Rome, Italy), Chairs

[3:30-4:45pm] Session 8 "Neurogenesis in physiological conditions"

Sebastian Jessberger (ETH Zurich, Switzerland)

"Gene expression profiling reveals novel mechanisms underlying adult neurogenesis"

Felice Tirone (CNR, Rome, Italy)

"Genetic modulation of neurogenesis and hippocampal function"

Nora Abrous (Univ. Bordeaux, France)

"Influence of spatial learning on neurogenesis"

Ingmar Blümcke (Erlangen, Germany)

"Neurogenesis and memory in the human hippocampus"

Stephan Schwarzacher (Goethe University, Frankfurt, Germany)

"Synaptic activation of maturing adult newborn granule cells"

[4:45-6:00pm] Session #9 "Neurogenesis in pathological conditions"

Jack Parent (University of Michigan, USA)

"Altered hippocampal neurogenesis in experimental temporal lobe epilepsy"

Merab Kokaia (Lund, Sweden)

"Functional integration of newborn granule cells into the epileptic hippocampus"

Kunlin Jin (Buck Inst. for Age Research, Novato, CA, USA)

"Functional contribution of neurogenesis after stroke"

Anders Tingström (Lund, Sweden)

"Neurogenesis in antidepressant treatment"

Paul Lucassen (Univ. Amsterdam, The Netherlands)

"Stress effects in hippocampal neurogenesis and structural plasticity"

FREE FOR DINNER

Tuesday, 24 May, 2011

9:00-10:00am Session #10 "Emerging tools to unravel the role of the hippocampus in epilepsy"

Paolo F Fabene (University of Verona) and **Michele Simonato** (University of Ferrara), Chairs

Paola Malerba (University of Utah, USA)

"Modeling rhythms contributes to the understanding of neural network dynamics"

Mario Buffelli (University of Verona, Italy)

"Multiphoton in vivo imaging of hippocampal cells in adult epileptic mouse"

Merab Kokaia (University of Lund, Sweden)

"Controlling seizures with optogenetic prosthetics"

Tommaso Fellin (Italian Institute of Technology, Genova, Italy)

"Holographic microscopy for the complex spatio-temporal illumination of neuronal networks"

10:00-11:15am Session #11 "Hippocampal epileptogenesis"

Robert Sloviter (University of Arizona, Tucson, USA), Chair

Annamaria Vezzani (Mario Negri Institute, Milano)

"Brain inflammation and epileptogenesis"

Peter Jedlicka (Goethe University, Frankfurt, Germany)

"Neuroligins regulate dentate gyrus synaptic transmission and network excitability in vivo"

Kazu Nakazawa (NIH/NIMH; Bethesda, MD, USA)

"Altered structure and function after selective dentate mossy cell deletion in a conditional mossy cell knockout mouse"

Argyle Bumanglag (Yale University, New Haven, USA)

"Immediate granule cell epileptogenesis associated with initial neuron loss in an animal model of temporal lobe epilepsy"

Robert Sloviter (University of Arizona, Tucson, USA)

"Fever, febrile seizures, hippocampal sclerosis, and hippocampal epileptogenesis; what causes what and when?"

11:15-12:30pm Session #12 "Reelin functions in the developing and adult hippocampus"

Eckart Förster (U. Hamburg) & **Joachim Herz** (U. Texas Southwestern), Chairs

Eckart Förster (University of Hamburg, Germany)

"Reelin and the secretory pathway in developing apical dendrites"

Joachim Herz (University of Texas, Dallas, USA)

"Reelin – the brain's Maginot line against Alzheimer"

Irene Knuesel (University of Zurich, Switzerland)

"Comparative analysis of reelin and amyloid-beta immunoreactivity in the postmortem human hippocampus"

Eduardo Soriano (Univ. Barcelona, Spain)

"Role of Reelin in adult plasticity"

Carola Haas (University of Freiburg, Germany)

"Importance of reelin processing for the maintenance of dentate gyrus lamination in the adult hippocampus"

12:30-2:15pm Free for Lunch

2:15-3:30pm Session #13 "Postnatal development of the primate hippocampus; from genes, to brain, to behavior"

Pierre Lavenex (University of Fribourg, Switzerland), Chair

Pierre Lavenex (University of Fribourg, Switzerland)

"Differential development of distinct hippocampal circuits"

Grégoire Favre (University of Fribourg, Switzerland)

"miRNAs contribute to the postnatal development of the primate hippocampus"

Hajnalka Abraham (University of Pécs, Hungary)

"Myelination in the human hippocampal formation"

Ricardo Insausti (Universidad Castilla-La Mancha, Albacete, Spain)

"Postnatal development of peptidergic populations in the human dentate gyrus"

Pamela Banta-Lavenex (University of Fribourg, Switzerland)

"Development of spatial relational memory in children"

3:30-4:45pm Session #14 "A new look on GABAergic synapse plasticity"

Jean-Marc Fritschy (Univ. Zurich, Switzerland), Chair

Jeremy Lambert (University of Dundee, Scotland)

"Functional properties of alpha 2 subunit-containing GABA-A receptors"

Patrizia Panzanelli (University of Turin, Italy)

"Molecular heterogeneity of perisomatic GABAergic synapses in CA1 pyramidal cells"

Shiva Tyagarajan (University of Zurich, Switzerland)

"Collybistin and cdc42 cooperate for gephyrin trafficking and clustering at postsynaptic sites"

Gabor Nyiri (Institute of Experimental Medicine, Budapest)

"NMDA receptors and nitric oxide signaling at GABAergic synapses"

Dominique Muller (University of Geneva, Switzerland)

"Dynamic control of the excitatory/inhibitory balance"

4:45-6:00pm Session #15 "Current perspectives on the interaction between stress, hippocampal neurogenesis, and depression"

Lisa Kalynchuk (U. Saskatchewan) and **Liisa Galea** (U. British Columbia), Chairs

Lisa Kalynchuk (University of Saskatchewan, Canada)

"Hippocampal structure and function in corticosterone-treated rats"

Hector Caruncho (University of Santiago de Compostela, Spain)

"Reelin as a putative vulnerability factor for depression"

Sue Becker (McMaster University, Canada)

"Evidence linking neurogenesis to recovery from depression in humans; opposing effects of stress and exercise on neurogenesis-dependent memory functions"

Neil Fournier (Yale University School of Medicine, New Haven, USA)

"Neurotrophic factors and depression: a novel role for VEGF-signaling in the cellular and behavioral actions of antidepressant treatment"

Liisa Galea (University of British Columbia, Canada)

"The contribution of gonadal hormones to depression"

7 PM WINE-TASTING AT ENOTECA ISTITUTO ENOLOGICO (via Sottoriva, 7/b)- Group 1
or FREE FOR DINNER

Wednesday, 25 May, 2011

9:00-10:15am Session #16 "Putting the entorhinal cortex and hippocampus in context"

Fraser Sparks (University of Lethbridge, Canada), Chair

Menno Witter (NTNU-Kavli Institute, Trondheim, Norway)

"The entorhinal mystery: how to understand the functional differentiation between lateral and medial entorhinal cortex"

Kate Jeffery (UCL, London, England)

"Representations of spatial context by place cells and grid cells"

James Ainge (University of St. Andrews, Scotland)

"The role of the lateral entorhinal cortex in object-context associations"

Fraser Sparks (University of Lethbridge, Canada)

"Representation of temporal context in hippocampus"

Wendy Suzuki (NYU, New York, USA)

"When did that happen? Temporal order signals in the medial temporal lobe"

10:15-11:15am Session #17 "Hippocampal function, route finding, and navigation"

Francesco Battaglia (Universiteit van Amsterdam), Chair

Laure Rondi-Reig (CNRS Univ. Paris 6, France)

"Multiple memory system interaction during route navigation"

Henrique Cabral (Universiteit van Amsterdam, Netherlands)

"Place cells, navigation, and NMDA receptors in CA1"

Hugo Spiers (University College London, England)

"The neural substrates of the navigational guidance system"

Christian Doeller (Radboud Universiteit Nijmegen, The Netherlands)

"Spatial representation and memory formation"

11:15-12:30pm Session #18 "The complexity of stress modulation of hippocampal activity and plasticity"

Gal Richter-Levin (University of Haifa, Israel), Chair

Oliver Stork, Iris Müller, and Anne Albrecht (Otto-von-Guericke University, Magdeburg, DE)

"Stress- and memory-induced changes in hippocampal interneuron gene expression"

Joachim Behr (University Hospital Charité, Berlin, DE)

"Stress suppresses monoaminergic neuromodulation of hippocampal inhibition"

Uwe Heinemann, Rizwan ulHaq, Agustin Liotta, Gürsel Caliskan, Anna Wojtowicz, and CJ Behrens (University Hospital Charité, Berlin, DE)

"Norepinephrine modulation of network oscillations with emphasis on induction of sharp wave ripples in rat hippocampus"

Menahem Segal (Weizmann Institute of Science, Rehovot, Israel)

"Long-term effects of stress on hippocampal plasticity"

Gal Richter-Levin, Ziv Ardi, Gilad Ritov (University of Haifa, Israel)

"Effects of stress and trauma on local hippocampal circuit activity"

12:30-2:30pm

FREE FOR LUNCH

2:30-3:45pm

Session #19

"Structure and Function of GABA receptors within the hippocampus"

Norman Bowery (Verona), Chair

Werner Sieghart (Medical University Vienna, Austria)

"GABA-A receptor subtypes: structure and pharmacology"

Hanns Möhler (University and ETH Zurich, Switzerland)

"Enhancement of cognitive functions via hippocampal α -5 GABA-A receptors"

Trevor Smart (UCL, London, England)

"GABA-A receptors: delineating the role of allosteric binding sites"

Norman Bowery (Verona, Italy)

"Significance of hippocampal GABA-B receptors?"

3:45-5:00pm

Session #20

"Interactions between the vestibular and auditory inner ear and the hippocampus"

Paul Smith and Cynthia Darlington (Otago University, New Zealand), Co-Chairs

Paul Smith (Otago University, New Zealand)

"Vestibular and auditory influences on the hippocampus"

Cynthia Darlington (Otago University, New Zealand)

"Chronic tinnitus induced by acoustic trauma and anxiety in rats"

Yiwen Zheng (Otago University, New Zealand)

"Effects of acoustic trauma-induced chronic tinnitus on spatial working memory in rats"

Stéphane Besnard (Univ. of Caen, France)

"Influence of vestibular input on spatial and non-spatial memory and on hippocampal NMDA receptors"

Lisa Geddes (University of Otago, New Zealand)

"The effects of galvanic vestibular stimulation on cell proliferation in the hippocampus"

7 PM WINE-TASTING AT ENOTECA ISTITUTO ENOLOGICO (via Sottoriva, 7/b)- Group 2

Thursday, 26 May, 2011

9:00-10:00am

Session #21

"The hippocampus: across time and timescales"

Howard Eichenbaum (Boston University) and **Neal Cohen** (Univ. Illinois), Chairs

Neal Cohen (University of Illinois, USA)

"The hippocampus supports long-term, short-term, and on-line representations"

Dharshan Kumaran (Institute of Cognitive Neuroscience, UCL, London, England)

"Linking separate episodic memories into a relational memory network"

Howard Eichenbaum (Boston University, USA)

"Time cells in the hippocampus"

David Foster (Johns Hopkins, Baltimore, USA)

"Characteristics of awake hippocampal replay"

10:00-11:00am Session #22 "Mapping the network: development of hippocampus and entorhinal cortex"

Rhiannon Meredith (Amsterdam, The Netherlands), Chair

Kally O'Reilly (NTNU-Kavli Institute, Trondheim, Norway)

"Development of hippocampal-entorhinal connectivity"

Jay Couey (NTNU-Kavli Institute, Trondheim, Norway)

"Formation of local connectivity in layer II of medial entorhinal cortex"

Rosamund Langston (Ctr. for Neuroscience, Dundee, Scotland)

"Developing navigation and spatial memory in the entorhinal-hippocampal network"

Rhiannon Meredith (VU University, Amsterdam, The Netherlands)

"Synaptic networks in early postnatal stages of entorhinal cortex circuitry"

11:00-12:15pm Session #23 "Sleep-based consolidation of hippocampal memory"

Jessica Payne (University of Notre Dame, USA), Chair

Sidarta Ribeiro (Federal University of Rio Grande do Norte, and Edmond and Lily Safra International Institute of Neuroscience of Natal, Brazil)

"Molecular and electrophysiological changes in the hippocampus following novel object exploration"

Juergen Fell (University of Bonn, Germany)

"Intracranial EEG correlates of human memory consolidation"

Jan Born (University of Lübeck, Germany)

"Slow oscillations orchestrating consolidation of hippocampus-dependent memory"

Susan Sara (Collège de France, Paris, France)

"Locus coeruleus neurons in tune with slow oscillations during sleep: a new player in off-line memory consolidation?"

Jessica Payne (University of Notre Dame, USA)

"Sleep leads to qualitative changes in emotional memory representation; role of the hippocampus"

12:15-2:15pm Free for Lunch

2:15-3:15pm Session #24 "Self-organization of allocentric spatial codes"
Alessandro Treves (SISSA, Cognitive Neuroscience, Trieste), Chair

Bailu Si (SISSA, Trieste, Italy)

"Self-organization of spatial representations in mEC"

John Lisman (Brandeis University, MA, USA)

"Self-organization of spatial representations in DG"

Erika Cerasti (College de France, Paris)

"Self-organization of spatial representations in CA3"

Federico Stella (SISSA, Trieste, Italy)

"Self-organization of spatial representations in CA1"

3:15-4:30pm Session #25 "Functional role of theta oscillations in entorhinal cortex"

Michael Yartsev (Weizmann Institute of Science, Rehovot, Israel), Chair

Lisa Giocomo (Trondheim, Norway)

"Scale of grid cells increases in HCN1 knockout mice"

Caswell Barry (UCL, London, England)

"Novelty, theta and grid cells"

Mark Brandon (Boston University, USA)

"Dissociation of grid cell periodicity and directional selectivity in the medial entorhinal cortex during disruption of theta oscillations"

Boris Gutkin (Paris, France)

"Grid-fields need dendritic independence but do not tolerate dendritic democracy"

Michael Yartsev (Weizmann Institute of Science, Rehovot, Israel)

"Grid cells without theta oscillations in the entorhinal cortex of bats"

4:30-5:30pm Session #26 "The role of cross-frequency coupling in learning and memory"

Elizabeth Buffalo (Emory University and the Yerkes National Primate Research Center), Chair

Emrah Düzel (University College London and Otto-von Guericke-University Magdeburg, DE)

"Decoding of memory replay in humans: phase-coupling to hippocampal theta"

Anton Sirota (University of Tübingen Center for Integrative Neuroscience, Germany)

"Theta-gamma coupling in cortical circuits"

Elizabeth Buffalo (Emory University and the Yerkes National Primate Research Center, Atlanta)

"Theta-gamma phase coupling in the monkey hippocampus"

Matt Jones (University of Bristol, England)

"Psychotic frequency coupling"